Differences for marine loading between MACT rule development and present

The initial MACT Subpart Y marine loading regulations were developed in the early 1990's (published in 1995) and were revised in 2011. Commercial market drivers, infrastructure, export law, and technology has changed significantly since the MACT Subpart Y rule development period. Differences between the period of MACT rule development and the present include:

1. Increased domestic crude oil production
2. U.S. petroleum refining capabilities and limitations
3. Crude oil export law
4. Global demand for U.S. crude oil
5. Logistical constraints

Additional information on domestic and global market changes which have led to the differences between the MACT Subpart Y rule development period and the present are provided in the *Project Description, Purpose, and Need* for the TGTI DWP License Application (Volume II – Environmental Evaluation, Section 1). The following outline summarizes key differences:

1. **Increased domestic crude oil production**
    a. 79% increase in domestic crude oil production by since 1995:
        i. 1995 - 6.6 million barrels per day (bpd)
        ii. 2019 - 11.8 million bpd (projected)
    b. Majority of U.S. crude oil production growth is in Texas (Permian and Eagle Ford Shales)
    c. Increase in light, low sulfur crude oil
2. **Refining capabilities and limitations**
    a. U.S. refineries are at maximum processing capacity or are not designed to process light, low sulfur crude oil
    b. Surplus crude oil production will be exported
3. **Crude oil export law**
    a. International export was prohibited during the MACT rulemaking period
    b. Crude export law changed in December 2015 enabling international export
4. **Global demand for U.S. crude oil**
    a. Increased global demand for U.S. crude oil
        i. Over 3 million bpd of new global refining capacity will come on line in the next two years
    b. U.S. crude export volumes
    (U.S. Energy Information Administration):
    https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCREXUS2&f=M
        i. From 1990 through 2011
            - **< 0.1 million bpd** (average 64 thousand bpd)
        ii. 2018
            - **2 million bpd** (approximate)
        iii. Projected
            - **5 million bpd** (potential by 2023)
            https://www.cnbc.com/2018/03/04/us-to-dominate-oil-industry-for-next-5-years-iea-forecasts.html

5. Logistical differences and constraints:

a. Differences in vessels (fleet) and petroleum products loaded:

i. When MACT Subpart Y was written in 1995 and revised in 2011, marine vessel loading predominantly involved refined product loading onto vessels that were much smaller than VLCCs. Loading of products onto VLCCs was not necessary due to market demand, supply chain structure, and crude export limitations which only necessitated the use of smaller vessels (refined product tankers):

ii. From 1990 to 2011:

- Refined liquid petroleum products:
  a. Refined products were transported from refineries to commercial markets on smaller vessels called 'clean' or 'product' tankers. Product tankers are inherently smaller than crude tankers because they deliver specific refined products to a location.
- Crude:
  a. International export was not allowed due to crude export law.
  b. Barges and smaller tankers were used for delivery from onshore tank farm terminals to domestic refinery destinations (sometimes due to pipeline infrastructure limitations).

iii. Present:

- Crude:
  a. Crude export is legal and demand for US crude has increased substantially
  b. Global shipping of crude is only economical with bulk transport (i.e., VLCCs)
  c. Demand for VLCCs to be loaded directly with US crude has gone up but port infrastructure cannot accommodate fully-laden VLCCs.
  d. Only current solution for VLCC loading from US is through reverse lightering using smaller crude tankers that can navigate to onshore terminals such as Suezmax, Aframax, and Panamax tankers.

b. Depth limitations for U.S. ports and inland marine terminals

i. VLCCs cannot be accommodated (fully loaded) at inland terminals due to:

- U.S. port draft restrictions
  a. Gulf Coast inland port depths range from 35 to 47 ft
- Inland terminal berthing limitations due to VLCC size

ii. VLCCs dimensions, limitations:

- 74 ft draft depth or greater when fully loaded
- 1,540 ft length, 200 ft width

c. Difference in marine loading capabilities and design:
    i. During MACT rulemaking (1990's & 2000's):
        - Phillips 66 - Rodeo, CA
            a. xxx bbl/hr
            b. yyy bbl/yr
            c. Extended dock / pier approximately 0.5 mile from shore
            d. 36 ft water depth
        - Chevron – Richmond, CA
            a. xxx bbl/hr
            b. yyy bbl/yr
            c. Extended dock / pier approximately 0.5 mile from shore
            d. 41 ft water depth
        - Ellwood Marine Terminal - Santa Barbara, CA (PTO No. 08232 – R9)
            a. xxx bbl/hr
            b. 4.38 million bbl/yr
            c. 0.49 miles offshore
            d. 60 ft water depth
            e. Serving two dedicated barges of 55 to 80 kbbl capacity
        - Hovensa – St. Croix, USVI
            a. xxx bbl/hr
            b. yyy bbl/yr
            c. Extended dock / pier approximately 1 mile from shore
        - Chevron Products – Kapolei, HI (permit no. 0098-01-C)
            a. 8,000 bbl/hr
            b. 4.6 million bbl/yr gasoline & diesel
    ii. Current and projected crude export needs:
        - Current crude export volumes: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCREXUS2&f=M
            a. 2.2 million bbd (June 2018)
            b. 660 million bbl/yr (based on 2018 YTD average)
        - Projected U.S. crude export volumes: https://www.cnbc.com/2018/03/04/us-to-dominate-oil-industry-for-next-5-years-iea-forecasts.html
            a. 5 million bpd
            b. 1,500+ million bbl/yr
        - Proposed TGTI DWP:
            a. 60,000 bbl/hr
            b. 192 million bbl/yr
            c. 90 ft depth
            d. 14 miles offshore
            e. 90 ft depth
            f. Serving global fleet of VLCCs of 2 million bbl capacity